

# PATENT ABSTRACTS OF JAPAN

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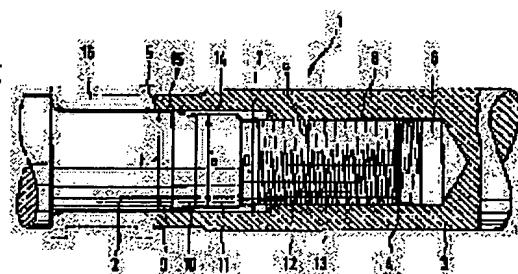
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(54) SHAFT COUPLING FOR BOTTOM CYLINDER OF DRAFTING UNIT ON  
SPINNING MACHINE

(57)Abstract:

PURPOSE: To prevent radial deviations of shafts caused by a shaft coupling by making a clearance fit at one engaging part of the shaft coupling and a press fit at the other engaging part.

CONSTITUTION: In the case of a shaft coupling 1 for bottom cylinders of drafting units of spinning machine, a shaft 2 is provided on its end with an area of a reduced diameter which engages in a longitudinal bore at the end of the other shaft 3. In the area of the longitudinal bore, the two shaft 2, 3 are connected with one another by means of a screw thread. In addition to the screw thread, the area of the reduced diameter also comprises two centering surfaces with fits, one fit being a clearance fit 14 and the other fit being a press fit 15. As a result, radial deviations of the shafts caused by the shaft coupling are to be avoided.



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## CLAIMS

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[Claim(s)]

[Claim 1] Some axial partitions of a different diameter which decreases to the direction of an edge in the region of an end on one shaft are prepared. These axial partitions engage with a longitudinal hole by the end of the shaft of another side, and this longitudinal hole suits with a diameter by the correspondence hole partition. In the shaft coupling for the bottom cylinders of the draft unit of the spinning machine which other two axial partitions which a 1 shaft partition and its correspondence hole partition have the screw which carries out the mold lock transfer of the driving force, and have a correspondence hole partition are equipped with the fitting section for forming a centering side, and changes The shaft coupling characterized by having made one fitting section into the clearance fitting section 14, and making the fitting section of another side into the press fit fitting section 15.

[Claim 2] The clearance fitting section 14 and the press fit fitting section 15 are a shaft coupling according to claim 1 characterized by being located in the screw 13 side opposite to the edge 4 of a shaft 2.

[Claim 3] The shaft coupling according to claim 2 characterized by for there being the clearance fitting section 14 first following a screw 13, and there being the press fit fitting section 15 following this.

[Claim 4] The clearance fitting section 14 is a shaft coupling according to claim 3 characterized by dissociating from the press fit fitting section 15 by the cone shaft partition 10.

[Claim 5] Diameter of the uniformly equal magnitude of a longitudinal hole 6 (D) Shaft coupling according to claim 3 or 4 characterized by assigning the clearance fitting section 14 and the press fit fitting section 15.

[Claim 6] The axial partition 11 assigned to the clearance fitting section 14 is a shaft coupling according to claim 1 to 5 characterized by the \*\*\*\*\* rather than the axial partition 9 assigned to the press fit fitting section 15.

[Claim 7] The axial partition 11 assigned to the clearance fitting section 14 is a shaft coupling according to claim 6 characterized by being [ of the axial partition 9 in which die length was assigned to the press fit fitting section 15 ] two times at least.

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## DETAILED DESCRIPTION

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### [Detailed Description of the Invention]

[0001] This invention prepares some axial partitions of a different diameter which decreases to the direction of an edge in the region of an end on one shaft about the shaft coupling of the bottom cylinder of the draft unit of a spinning machine. These axial partitions engaged with the longitudinal hole by the end of the shaft of another side, this longitudinal hole suited with the diameter by the correspondence hole partition, a 1 shaft partition and its correspondence hole partition had the screw which carries out the mold lock transfer of the driving force, and other two axial partitions with a correspondence hole partition are equipped with the fitting section for forming a centering side.

[0002] In the case of the shaft coupling (European Patent specification EP 446690A1) of this format, the one fitting section which forms a centering side, respectively is prepared in the both sides of a screw. Consequently, the guidance length of a centering side increases as a whole. the above-mentioned patent specification indicates nothing about the format of the fitting section of a centering side, but since a deer is carried out and the two fitting sections are usually prepared in this shaft coupling, it must be said that these fitting sections are the narrow fitting sections of tolerance. However, even if metaphor tolerance is very narrow, whenever it prepares the clearance fitting section in a centering side, a gap arises in radial to some extent. because, the axial partition in a centering side -- an aperture -- a slightly large hole -- it is because it shifts to a divisional outer diameter.

[0003] The purpose of this invention is preventing a gap of radial in the case of the shaft coupling of the format described first.

[0004] This purpose is attained by making one fitting section into the clearance fitting section, and making the fitting section of another side into the press fit fitting section.

[0005] As a result of the diameter of the press fit fitting section becoming an excessive dimension according to tolerance, the centering of the edge region of the shaft coupling which should be combined is carried out without play about mutual. Although the clearance fitting section chosen as the second fitting section avoids the redundancy of the region of a shaft coupling, the reason is that a centering with an excessive dimension is performed only in one of the two fitting

sections. Although the fitting section of another side has sufficient play, this play is 0.025mm in fact. It does not exceed.

[0006] Advantageously, the clearance fitting section and the press fit fitting section are located in a screw side opposite to the edge of a shaft. The advantage of this configuration approaches as much as possible at the end of the shaft coupling with which the centering side of a longitudinal hole includes a longitudinal hole; is located, and is that manufacture precision improves by this as compared with the longitudinal hole which has a centering side in the region of the Koki section with the current technical level.

[0007] In respect of other development of this invention, the clearance fitting section is in the degree of a screw, and there is the press fit fitting section following this. Consequently, the centering side about the press fit fitting section will be located in the start point of a longitudinal hole, and, as a result, wearing of a shaft coupling becomes easy.

[0008] For convenience, the clearance fitting section is separated from the press fit fitting section by the cone shaft partition. Consequently, it transfers from the clearance fitting section gradually to the press fit fitting section, and it becomes easy to insert the axial partition of one shaft in coincidence in this case to the longitudinal hole of the shaft of another side.

[0009] The continuously equal diameter of a longitudinal hole is assigned to the clearance fitting section and the press fit fitting section in respect of advantageous development of this invention. There is an important advantage in this. That is, a longitudinal hole is processible in the region of a centering side in spite of the two different fitting sections with single tool accommodation.

[0010] In respect of advantageous development of this invention, the axial partition assigned to the clearance fitting section is longer than the axial partition assigned to the press fit fitting section. In this case, it has come out of the recognition referred to as making small the die length of the shaft with which this invention was assigned to the press fit fitting section as much as possible. This will decrease the cash-drawer force under removal of a shaft coupling to coincidence.

[0011] the die length of the axial partition by which the die length of the axial partition assigned to the clearance fitting section was assigned to the press fit fitting section for convenience -- at least -- two times -- it is . It became clear that the axial partition of the related die length belonging to the axial partition of die length and the 7mm clearance fitting section belonging to the 3mm press fit fitting section is useful.

[0012] Other advantages and descriptions of this invention will become clear from the following publications about the example which is drawing of longitudinal section in the region of a shaft coupling.

[0013] A shaft coupling 1 combines two shafts 2 and 3 mutually. This shaft coupling 1 fits the bottom cylinder of the draft unit of a spinning machine. Consequently, a shaft with a die length of 30m is acquired after association.

[0014] In order to join together, the region of the edge 4 of a shaft 2 is inserted in the longitudinal hole 6 of the region of the edge 5 of a shaft 3. The left end which a shaft 2 does not illustrate looks like the edge 5 of a shaft 3, and the right end

which a shaft 3 does not illustrate looks like the edge 4 of a shaft 2.

[0015] the hole which has the continuously uniform diameter D in the longitudinal hole 6 of a shaft 3 in the region of an edge 5 -- a partition 7 is formed. There are other hole partitions 8 following hole partition 7, and this hole partition 8 has the small nominal diameter c which has a screw 13.

[0016] The region of the edge 4 of the shaft 2 inserted in a longitudinal hole 6 has a total of four axial partitions 9, 10, 11, and 12. The shafts 2 and 3 with which it is prepared, and a screw 13 carries out a deer to the axial partition 12 which faces an edge 4 and has the same diameter c as hole partition 8, and is combined with it can perform mold lock transfer of driving force unitedly. The pitch of a screw is the thing of extent which cannot be separated mutually, while shafts 2 and 3 operate it.

[0017] the tubed shaft partitions 9 and 11 -- the inside of the longitudinal hole 6 of a shaft 3 -- especially -- a hole -- it is used for the centering of the region of the edge 4 of a shaft 2 within a partition 7. the outer diameter a of the axial partition 11, and the outer diameter b of the axial partition 9 -- the region of the axial partition 11 -- setting -- the clearance fitting section 14 -- a hole -- it is chosen so that it may be obtained with a partition 7 and the press fit fitting section may be obtained with the hole partition 7 in the region of the axial partition 9. It is combined by the cone shaft partition 10, and the deer of the axial partitions 11 and 9 is carried out, and its diameter increases a shaft 2 from a to b. The axial partitions 11, 10, and 9 are located in the screw 13 side opposite to an edge 4.

[0018] Like illustration, the die length of the axial partition 11 assigned to the clearance fitting section 14 is twice [ at least ] the die length of the axial partition 9 assigned to the press fit fitting section 15. This means that the axial partition 9 is prolonged only to the point that the edge 5 of a shaft 3 is located. When equipped with a shaft coupling 1, although the edge 5 of a shaft 3 is not illustrated, it is opposite\*\*\*\*\*\*(ed) by the bearing ring 16 shown with the slash of the bearing arranged in the bearing frame stand.

[0019] The clearance between the clearance fitting sections 14 between hole partition 7 is exaggerated as the axial partition 11 by a diagram. In fact, the dimension of a clearance is 0.006mm. Or it is 0.025m. According to the current technique, the dimension range of an individual is common to a shaft coupling.

[0020] According to this invention, a clearance 14 is the back of the cone shaft partition 10, and changes to the press fit fitting section 15. At this region, it is 0 between hole partition 7 as the axial partition 9. It twists, carries out [ are, ] and is 0.019mm. An excessive dimension exists. Consequently, especially the axial partition 9 can carry out a centering without play certainly in a longitudinal hole in the region of the edge 5 of a shaft 3. in this case, the die length of the axial partition 9 -- about 3mm it is . On the other hand, the axial partition 11 in the region of the clearance fitting section 14 is twice [ at least ] the die length of this.

[0021] The short centering projection which prevents the radiation direction deflection in the region of the press fit fitting section in the region of the axial partition 9, therefore a shaft coupling 1 is obtained.

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## DESCRIPTION OF DRAWINGS

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[Brief Description of the Drawings]

[Drawing 1] It is the fragmentary sectional view showing the shaft coupling by the example of this invention.

[Description of Notations]

1 Shaft Coupling

2 Three Shaft

14 Clearance Fitting Section

15 Press Fit Fitting Section

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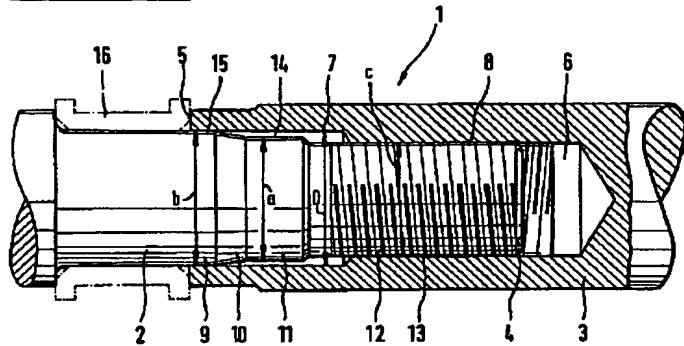
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**DRAWINGS**

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**[Drawing 1]**



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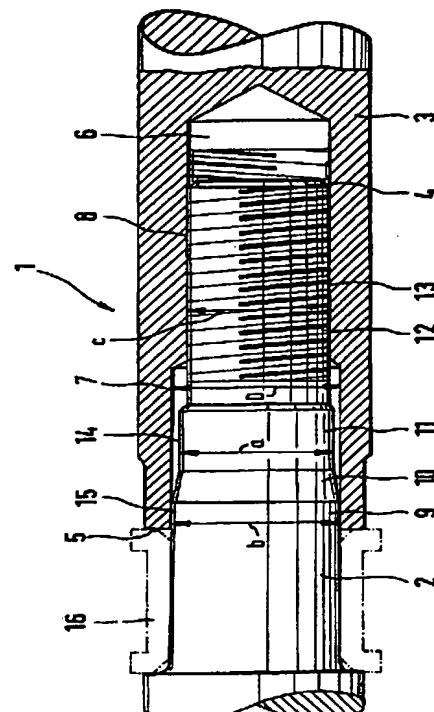
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(54)【発明の名称】 紡機のドラフトユニットのボトムシリンダの軸継手

(57)【要約】 (修正有)

【目的】 軸継手の一方の嵌合部を隙間嵌合部とし、他方の嵌合部を圧入嵌合部とすることにより、軸継手の半径方向のずれを防止する。

【構成】 紡機のドラフトユニットのボトムシリンダの軸継手1の場合、軸2、3にはその端に、他方の軸の端の縦孔と係合する減少直径の部域が設けられる。縦孔の部域において、2本の軸がネジにより互いに接続される。ネジに加えるに、減少直径の部域は嵌合部を持つ二つの心出し面を含み、一方の嵌合部は隙間嵌合部14であり、他方の嵌合部は圧入嵌合部15である。その結果、軸継手により生ぜしめられる放射方向偏倚が回避される。



## 【特許請求の範囲】

【請求項1】一方の軸に一端の部域において端の方へ減少する異なる直径の軸区分を数個設け、これらの軸区分は他方の軸の一端で縦孔と係合し、この縦孔は対応孔区分により直径と適合し、一軸区分とその対応孔区分は駆動力を型錠止伝達するネジを有し、対応孔区分を持つ二つの他の軸区分は心出し面を形成するための嵌合部を備えて成る紡機のドラフトユニットのボトムシリンダ用の軸継手において、一方の嵌合部を隙間嵌合部14とし、他方の嵌合部を圧入嵌合部15としたことを特徴とする軸継手。

【請求項2】隙間嵌合部14及び圧入嵌合部15は軸2の端4と反対のネジ13の側に位置することを特徴とする請求項1記載の軸継手。

【請求項3】ネジ13に統いて先ず隙間嵌合部14があり、これに統いて圧入嵌合部15があることを特徴とする請求項2記載の軸継手。

【請求項4】隙間嵌合部14は円錐形軸区分10により圧入嵌合部15から分離されたことを特徴とする請求項3記載の軸継手。

【請求項5】縦孔6の均一に等しい大きさの直径(D)を隙間嵌合部14及び圧入嵌合部15へ割り当てたことを特徴とする請求項3または4記載の軸継手。

【請求項6】隙間嵌合部14に割り当てられた軸区分11は圧入嵌合部15に割り当てられた軸区分9よりも長いことを特徴とする請求項1ないし5のいずれかに記載の軸継手。

【請求項7】隙間嵌合部14に割り当てられた軸区分11は長さが圧入嵌合部15に割り当てられた軸区分9の少なくとも二倍であることを特徴とする請求項6記載の軸継手。

## 【発明の詳細な説明】

【0001】本発明は紡機のドラフトユニットのボトムシリンダの軸継手に関するもので、一方の軸に一端の部域において端の方へ減少する異なる直径の軸区分を数個設けたものである。これらの軸区分は他方の軸の一端で縦孔と係合し、この縦孔は対応孔区分により直径と適合し、一軸区分とその対応孔区分は駆動力を型錠止伝達するネジを有し、対応孔区分を持つ二つの他の軸区分は心出し面を形成するための嵌合部を備えている。

【0002】この形式の軸継手(ヨーロッパ特許明細書EP446690A1)の場合、それぞれ心出し面を形成する一つの嵌合部がネジの両側に設けられる。その結果、心出し面の案内長が全体として増加する。上記特許明細書は心出し面の嵌合部の形式についてはなにも記載しておらず、しかして二つの嵌合部はかかる軸継手に通常設けられるものだから、これらの嵌合部は公差の狭い嵌合部であると云わなければならない。しかし、例え公差が非常に狭いものであっても、心出し面に隙間嵌合部を設けると常にある程度半径方向にずれが生じる。なぜなら

ば、心出し面における軸区分は孔径が僅かに大きい孔区分の外径へ移行するからである。

【0003】本発明の目的は初めに述べた形式の軸継手の場合に半径方向のずれを防止することである。

【0004】この目的は一方の嵌合部を隙間嵌合部とし他方の嵌合部を圧入嵌合部とすることにより達成される。

【0005】圧入嵌合部の直径が公差により過大寸法になる結果、結合されるべき軸継手の端部域が遊びなしに相互に関して心出しされる。第二の嵌合部に選択された隙間嵌合部は軸継手の部域の冗長性を回避するが、その理由は過大寸法による心出しが二つの嵌合部のうちの一つのみにおいて行われるからである。他方の嵌合部は十分な遊びを有するが、実際にはこの遊びは0.025mmを越えない。

【0006】有利には、隙間嵌合部及び圧入嵌合部は、軸の端と反対のネジの側に位置する。この構成の利点は縦孔の心出し面が縦孔を含む軸継手の端に可及的に接近して位置し、これにより、現在の技術水準では孔基部の部域に心出し面を有する縦孔と比較して、製作精度が向上することである。

【0007】本発明の他の発展面では、ネジの次に隙間嵌合部があり、これに統いて圧入嵌合部がある。その結果、圧入嵌合部に関する心出し面が縦孔の開始点に位置することになり、その結果軸継手の装着が容易になる。

【0008】便宜上、隙間嵌合部は圧入嵌合部から円錐形軸区分により分離されている。その結果、隙間嵌合部から圧入嵌合部へ漸次転移し、この場合、同時に、一方の軸の軸区分を他方の軸の縦孔へ挿入するのが容易になる。

【0009】本発明の有利な発展面では、縦孔の連続的に等しい直径が隙間嵌合部及び圧入嵌合部に割り当てられる。これには重要な利点がある。即ち、二つの異なる嵌合部にも拘らず、縦孔は心出し面の部域において単一の工具調節により加工できる。

【0010】本発明の有利な発展面では、隙間嵌合部へ割り当てられた軸区分は圧入嵌合部へ割り当てられた軸区分よりも長い。この場合、本発明は圧入嵌合部に割り当てられた軸の長さは可及的に小さくすべきであると云う認識から出ている。同時にこのことは軸継手の取り外し中の引出し力を減少することになる。

【0011】便宜上、隙間嵌合部へ割り当てられた軸区分の長さは圧入嵌合部へ割り当てられた軸区分の長さの少なくとも二倍である。3mmの圧入嵌合部に属する長さの軸区分及び7mmの隙間嵌合部に属する長さの軸区分が有用であることが判明した。

【0012】本発明の他の利点と特徴は軸継手の部域における縦断面図である実施例についての以下の記載から明らかになろう。

【0013】軸継手1は2本の軸2と3を相互に結合す

る。かかる軸継手1は紡機のドラフトユニットのボトムシリンダに適する。その結果、結合後に、30mの長さの軸が得られる。

【0014】結合するには、軸2の端4の部域を軸3の端5の部域の縦孔6へ挿入する。軸2の図示しない左端は軸3の端5のように見え、軸3の図示しない右端は軸2の端4のように見える。

【0015】端5の部域において、軸3の縦孔6には連続的に均一な直径Dを有する孔区分7が設けられる。孔区分7に統いて他の孔区分8が有り、この孔区分8はネジ13を有する小さい公称直径cを有する。

【0016】縦孔6へ挿入される軸2の端4の部域は合計4個の軸区分9、10、11、12を有する。端4に面し且つ孔区分8と同じ直径cを有する軸区分12にはネジ13が設けられ、しかして結合される軸2と3は結合して駆動力の型錠止伝達を行うことができる。ネジのピッチは軸2と3が操作中に互いに分離できないよう程度のものである。

【0017】筒状軸区分9と11は軸3の縦孔6内、特に孔区分7内で軸2の端4の部域の心出しに使用される。軸区分11の外径a及び軸区分9の外径bは、軸区分11の部域において隙間嵌合部14が孔区分7と共に得られ、かつ軸区分9の部域において圧入嵌合部が孔区分7と共に得られるように選択されている。軸区分11と9は円錐形軸区分10により結合され、しかして軸2は直径がaからbへ増す。軸区分11、10、9は端4と反対のネジ13の側に位置する。

【0018】図示のごとく、隙間嵌合部14へ割り当てられた軸区分11の長さは圧入嵌合部15へ割り当てら

れた軸区分9の長さの少なくとも2倍である。このことは、軸区分9が軸3の端5が位置する点へのみ延びることを意味する。軸継手1が装着されると、軸3の端5は図示しないが軸受けフレームスタンドに配置された軸受けの斜線で示す軸受けリング16に対接支持される。

【0019】軸区分11と孔区分7との間の隙間嵌合部14の隙間は図では誇張されている。実際には、隙間の寸法は0.006mmないし0.025mmである。個の寸法範囲は現在の技術によれば軸継手に普通のものである。

【0020】本発明によれば、隙間14は、円錐形軸区分10の背後で、圧入嵌合部15へ変化する。この部域では、軸区分9と孔区分7との間で0ないし0.019mmの過大寸法が存在する。その結果、軸区分9は特に軸3の端5の部域で遊びなしに縦孔内で確実に心出しできる。この場合、軸区分9の長さは約3mmである。これに對し、隙間嵌合部14の部域における軸区分11は長さが少なくとも2倍である。

【0021】軸区分9の部域における圧入嵌合部の故に、軸継手1の部域における放射方向偏倚を阻止する短い心出し突起が得られる。

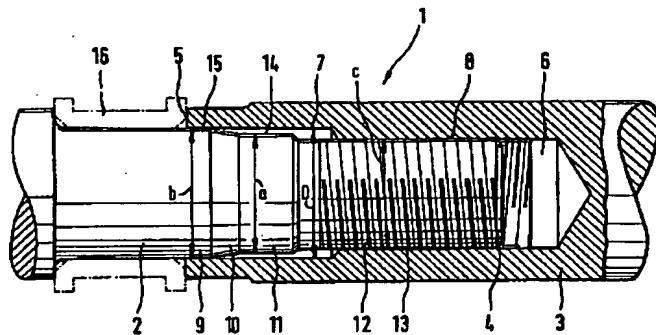
#### 【図面の簡単な説明】

【図1】本発明の実施例による軸継手を示す部分断面図である。

#### 【符号の説明】

1	軸継手
2、3	軸
14	隙間嵌合部
15	圧入嵌合部

【図1】



フロントページの続き

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